

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.:	Unknown)
)
Filing Date:	Unknown)
)
Priority Date:	2 December 2000)
)
Applicants:	BALDOCK, Mark R.)
)
For:	PREDICTIVE TUNING ON MULTI-TUNER)
	BROADCAST DATA RECEIVERS)

PRELIMINARY AMENDMENT

Director For Patents
Box: New Application
Washington, D.C. 20231

Dear Sir:

This is a preliminary amendment to the enclosed application entitled "Predictive Tuning on Multi-Tuner Broadcast Data Receivers" claiming priority to British Patent Application No. 0029464.5 filed 2 December 2000.

In the Specification:

Please amend the specification as follows:

Page 1, after the title, insert the following headers and paragraph:

--CROSS-REFERENCE TO RELATED APPLICATION

This application claims priority to British Patent Application No. 0029464.5 filed 2 December 2000.

BACKGROUND OF THE INVENTION-

Page 1, line 5, change "organisation" to --organization--; line 11, change "maximise" to --maximize--.

Page 2, before line 20, insert the Header:

--SUMMARY OF THE INVENTION--

Page 2, line 24, change "characterised" to --characterized--.

Page 3, line 20, change "programme" to --program--.

Page 5, line 10, change "behaviour" to --behavior--;

Page 6, before line 27 insert the following header:

--BRIEF DESCRIPTION OF THE DRAWINGS--

Page 7, before line 2, add the Header:

--DESCRIPTION OF THE PREFERRED EMBODIMENTS--

Page 8, line 15, change "stabilised" to --stabilized--; line 30, change "favourite" to --favorite--.

Page 10 after the last line, insert the following paragraph:

--While the invention has been described with a certain degree of particularity, it is manifest that many changes may be made in the details of construction and the arrangement of components without departing from the spirit and scope of this disclosure. It is understood that the invention is not limited to the embodiments set forth herein for purposes of exemplification, but is to be limited only by the scope of the attached claim or claims, including the full range of equivalency to which each element thereof is entitled.--

IN THE CLAIMS:

1. (Amended) A broadcast data receiver [(BDR)] for receiving broadcast digital data, said receiver [including] comprising:

a plurality of tuners, each controlled independently for selective tuning to receive one of a range of data [RF] radio frequency carriers at known frequencies [and characterised in that]

including,

a first tuner [is] controlled to tune to a frequency to receive data for a user selected television channel in accordance with user requirements at [that] an instant [and, if];

a further tuner [is] being free at said [that] instant[, it is] and tuned to receive data for a channel differing to that which is selected for viewing at [that] said instant; and

control means for making [said] channel identity [is] based on a prediction [made by the control means for the BDR].

2. (Amended) A broadcast data receiver according to claim 1 [characterised in that the] wherein said further tuner [is] being tuned to receive data for a predicted channel which is on the same [RF] radio frequency carrier frequency as [that to which the] said first tuner [is tuned].

3 (Amended) A broadcast data receiver according to claim 1 [characterised in that the] wherein said further tuner [is] being tuned to receive data for the predicted channel [which is] on a[n RF] radio frequency carrier at a frequency which is different [to that to which the] from said first tuner [is tuned] frequency.

4. (Amended) A broadcast data receiver according to claim 1 [characterised in that] wherein when the predicted channel data is carried on a[n RF] radio frequency carrier at the same frequency as [that to which the] said first tuner is already tuned, the prediction is ignored and the next most probable prediction generated and this continues until a channel with data on an [RF] radio frequency carrier at a different frequency is identified.

5. (Amended) A broadcast data receiver according to claim 1 [characterised in that the] wherein said first tuner [is] being tuned to a[n RF] radio frequency carrier on which data for a user selected channel is carried and such data received, and processed, to generate a television [programme] program at that time and [the] said further tuner is used to receive data for a second channel and data received for that channel is stored for subsequent retrieval and when a tuner is being used for neither of said functions it is deemed to be free and controlled to tune to a predicted channel.

6. (Amended) A broadcast data receiver according to claim 1 [characterised in that the] wherein said further tuner [of the multi-tuner BDR is] being used to tune to the [RF] radio frequency carrier for a channel predicted to be subsequently selected by [the] a user[,], on the basis of a prediction made referring to previous user channel selection patterns.

7. (Amended) A broadcast data receiver according to claim 6 [characterised in that] wherein the previous user channel selection patterns are based on the actual [BDR] broadcast data receiver user or user's channel selections [which are] being stored in memory in [the BDR] said broadcast data receiver for reference.

8. (Amended) A broadcast data receiver according to claim 6 [characterised in that the] wherein previous user channel selection patterns are generic data provided by the broadcaster and stored in [the BDR] said broadcast data receiver memory.

9. (Amended) A broadcast data receiver according to claim 1 [characterised in that if the] wherein when a user [does] subsequently selects to change [the BDR] said broadcast data receiver to generate and display a channel[, and said channel] that matches the predicted channel, [the BDR] said broadcast data receiver selects to receive the data for that channel from [the] said further tuner [which is already] being tuned to receive the data for the predicted channel.

10. (Amended) A broadcast data receiver according to claim 1 [characterised in that the RF] wherein the radio frequency carrier on which the predicted channel data is carried is identified and [the] said further tuner, if free at that instant, or as soon as the same is free from performing other functions, is used to tune to the appropriate carrier frequency.

11. (Amended) A broadcast data receiver according to claim 1 [characterised in that if the] wherein when a user [does] subsequently selects a new channel to view and [said] the selected channel does not match the predicted channel [the BDR] said broadcast data receiver controls one of said tuners to tune to the appropriate [RF] radio frequency carrier for the data for the selected channel.

12. (Amended) A broadcast data receiver according to claim 1 [characterised in that if] wherein when more than two tuners are provided in [the BDR] said broadcast data receiver a number of predicted channels [can] may be selected and the carriers tuned to.

13. (Amended) A method for controlling the tuning of a plurality of tuners provided in a broadcast data receiver for broadcast digital data, said method comprising the steps of: [receiver

including a plurality of tuners for selective tuning independently to]

[receive] receiving one of a range of [RF] radio frequency data carriers which are transmitted from a broadcaster over a range of [RF] radio frequencies[.];

said [BDR] broadcast data receiver allowing the selection by the user of a television channel for viewing via a display screen and speakers connected with the broadcast data receiver [and characterised in that];

controlling a first tuner [is controlled] to tune to a particular frequency for an [RF] radio frequency data carrier to receive data for a user selected television channel to be viewed via the broadcast data receiver and, if a further tuner is free at that instant, said further tuner is tuned to receive data for a channel differing to that which is selected for viewing at that instant and said channel identity is based on a prediction made by the control means for the broadcast data receiver.

14. (Amended) A method according to claim 13 [characterised in that] wherein the channel selected for viewing is identified as part of the channel prediction process and, with reference to that channel, reference is made to a memory means in which data relating to previous channel selection patterns is held and the channel or channels which have been subsequently selected by the user on previous occasions is referred to and from this data, a predicted channel identity is determined and the further tuner of the [BDR] broadcast data receiver is tuned to the appropriate [RF] radio frequency carrier for the predicted channel data.

15. (New) A broadcast data receiver for receiving broadcast digital data, said receiver comprising:

control means for selective tuning and for channel identity selection prediction;

storage means for storing data; and

a plurality of tuners to receive a range of data radio frequency carriers at known frequencies, including a first tuner tuned to a first radio frequency carrier frequency for receiving data for a user selected television channel in accordance with user requirements at an instant and at least one second tuner.

16. (New) A broadcast data receiver according to claim 15 wherein said control means determines the frequency of the predicted channel data carried on a radio frequency carrier.

17. (New) A broadcast data receiver according to claim 16 wherein said control means ignores said predicted channel data occurring on said first radio frequency carrier frequency and thereafter generates the next most probably prediction having data on a radio frequency carrier other than said first radio carrier frequency.

18. (New) A broadcast data receiver according to claim 15 wherein said at least one second tuner stores data received for a second channel in said storage means for subsequent retrieval.

19. (New) A broadcast data receiver according to claim 15 wherein said at least one second tuner may be deemed free and controllable for tuning to a predicted channel.

20. (New) A method for controlling the tuning of a plurality of tuners provided in a broadcast data receiver for broadcast digital data, said method comprising the steps of:

receiving one of a range of radio frequency data carriers transmitted from a broadcaster

over a range of radio frequencies;

selecting a television channel for view via a display screen and speakers connected with the broadcast data receiver by a user of the broadcast data receiver;

controlling a first tuner to tune to a particular frequency for a radio frequency data carrier to receive data for a user selected television channel to be viewed via the broadcast data receiver;

tuning at least one free tuner at that instant to receive data for another channel for viewing at that instant; and

basing channel identity on a prediction made by the control means for the broadcast data receiver.

REMARKS

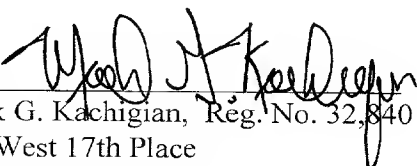
Attached is the clean version of the claims and new paragraphs as required in Section 1.121(4) (ii).

The application should now be in condition for examination, which is respectfully requested.

Respectfully Submitted

HEAD, JOHNSON & KACHIGIAN

Dated: 29 November 2001

BY: 
Mark G. Kachigian, Reg. No. 32,840
228 West 17th Place
Tulsa, Oklahoma 74119
(918) 584-4187
Attorneys for Applicant

New Header to be Inserted on Page 1, before line 1:

--CROSS-REFERENCE TO RELATED APPLICATION

This application claims priority to British Patent Application No. 0029464.5 filed 2 December 2000

BACKGROUND OF THE INVENTION

The invention to which this application relates is a Broadcast Data Receiver (BDR) of the type which is used to receive data, typically digital data, which is broadcast from a remote location. The data is typically transmitted from a broadcast location by a commercial broadcast organization, to a plurality of receiving locations, such as domestic premises in which a broadcast data receiver is located. The data can be transmitted via any of a number of methods such as, satellite transmission systems, cable transmission systems or terrestrial broadcast systems.

In this type of system the BDR receives the data in an encoded form which is designed to maximize the amount of data which can be carried in the data stream. At the BDR, the data is decoded and processed to allow the generation of audio, video and/or auxiliary information via a display screen such as that of a television set, which is connected to the BDR or the BDR is provided as an integral part of the television set.

SUMMARY OF THE INVENTION

Replacement Paragraph to be Inserted into Page 2:

In a first aspect of the invention there is provided a broadcast data receiver (BDR) for receiving broadcast digital data, said receiver including a plurality of tuners, each controlled independently for selective tuning to receive one of a range of data RF carriers at known frequencies and characterized in that a first tuner is controlled to tune to a frequency to receive data for a user selected television channel in accordance with user requirements at that instant and, if a further tuner is free at that instant, it is tuned to receive data for a channel differing to that which is selected for viewing at that instant and said channel identity is based on a prediction made by the control means for the BDR.

Replacement Page to be Inserted into Page 5

Typically, the BDR monitors the user's real-time channel selection behavior and attempts to predict the users next action and set up the tuning resources appropriately to eliminate a delay in changing RF carriers. Thus, when the BDR usage pattern does not require all tuners to be locked to specific RF carrier frequencies, any spare tuning capability can be assigned to predictive tuning as a background activity.

Replacement Paragraph to be Inserted into Page 6:

In a further aspect of the invention there is provided a method for controlling the tuning of a plurality of tuners provided in a broadcast data receiver for broadcast digital data, said receiver including a plurality of tuners for selective tuning independently to receive one of a range of RF data carriers which are transmitted from a broadcaster over a range of RF radio frequencies, said BDR allowing the selection by the user of a television channel for viewing via a display screen and speakers connected with the broadcast data receiver and characterized in that a first tuner is controlled to tune to a particular frequency for an RF data carrier to receive data for a user selected television channel to be viewed via the broadcast data receiver and, if a further tuner is free at that instant, said further tuner is tuned to receive data for a channel differing to that which is selected for viewing at that instant and said channel identity is based on a prediction made by the control means for the broadcast data receiver.

Header to be Inserted into Page 6

BRIEF DESCRIPTION OF THE DRAWINGS

Replacement Paragraphs to be Inserted into Page 8:

service 14 at this time, the BDR software determines from the user's channel list the next channel which would be selected by the "Channel Up" selection, in this case the next ascending channel 22 "SKY1". The data for the predicted channel is identified as being on an RF carrier of a different frequency to that of the currently viewed channel. According to the present invention and with the second BDR tuner 6 available to it, the BDR sets the second tuner 6 to tune to the new predicted RF carrier for the channel 22 in advance of the user pressing the "Channel Up" key. When the next user channel selection is made, if it is in accordance with the predicted channel, the control means switches from the data transport stream from tuner 4 to the data transport stream from tuner 6 with minimal delay as the "incoming" data transport stream for the predicted channel SKY1, 22 will already have stabilized as it is already being received on the tuner 6 so that all that is required is for the BDR to change between tuners from which the data stream is obtained and then generate the newly selected channel.

Events are defined for each user interaction that would potentially affect the tuning to incoming carriers. For example, the BDR data might include events, "the user has just changed downward a channel in the numerically ordered list of favorite channels" and "the user has just selected a specific channel by

New Paragraph for Page 10 to be Inserted After the Last Line:

While the invention has been described with a certain degree of particularity, it is manifest that many changes may be made in the details of construction and the arrangement of components without departing from the spirit and scope of this disclosure. It is understood that the invention is not limited to the embodiments set forth herein for purposes of exemplification, but is to be limited only by the scope of the attached claim or claims, including the full range of equivalency to which each element thereof is entitled.

Clean Version of the Claims

1. (Amended) A broadcast data receiver for receiving broadcast digital data, said receiver comprising:

a plurality of tuners, each controlled independently for selective tuning to receive one of a range of data radio frequency carriers at known frequencies including,

a first tuner controlled to tune to a frequency to receive data for a user selected television channel in accordance with user requirements at an instant;

a further tuner being free at said instant and tuned to receive data for a channel differing to that which is selected for viewing at said instant; and

control means for making channel identity based on a prediction.

2. (Amended) A broadcast data receiver according to claim 1 wherein said further tuner being tuned to receive data for a predicted channel which is on the same radio frequency carrier frequency as said first tuner.

3 (Amended) A broadcast data receiver according to claim 1 wherein said further tuner being tuned to receive data for the predicted channel on a radio frequency carrier at a frequency which is different from said first tuner frequency.

4. (Amended) A broadcast data receiver according to claim 1 wherein when the predicted channel data is carried on a radio frequency carrier at the same frequency as said first tuner is already tuned, the prediction is ignored and the next most probable prediction generated and this continues until a channel with data on an radio frequency carrier at a different frequency is identified.

5. (Amended) A broadcast data receiver according to claim 1 wherein said first tuner being tuned to a radio frequency carrier on which data for a user selected channel is carried and such data received, and processed, to generate a television program at that time and said further tuner is used to receive data for a second channel and data received for that channel is stored for subsequent retrieval and when a tuner is being used for neither of said functions it is deemed to be free and controlled to tune to a predicted channel.

6. (Amended) A broadcast data receiver according to claim 1 wherein said further tuner being used to tune to the radio frequency carrier for a channel predicted to be subsequently selected by a user on the basis of a prediction made referring to previous user channel selection patterns.

7. (Amended) A broadcast data receiver according to claim 6 wherein the previous user channel selection patterns are based on the actual broadcast data receiver user or user's channel selections being stored in memory in said broadcast data receiver for reference.

8. (Amended) A broadcast data receiver according to claim 6 wherein previous user channel selection patterns are generic data provided by the broadcaster and stored in said broadcast data receiver memory.

9. (Amended) A broadcast data receiver according to claim 1 wherein when a user subsequently selects to change said broadcast data receiver to generate and display a channel that matches the predicted channel, said broadcast data receiver selects to receive the data for that channel from said further tuner being tuned to receive the data for the predicted channel.

10. (Amended) A broadcast data receiver according to claim 1 wherein the radio frequency carrier on which the predicted channel data is carried is identified and said further tuner, if free at that instant, or as soon as the same is free from performing other functions, is used to tune to the appropriate carrier frequency.

11. (Amended) A broadcast data receiver according to claim 1 wherein when a user [does] subsequently selects a new channel to view and the selected channel does not match the predicted channel said broadcast data receiver controls one of said tuners to tune to the appropriate radio frequency carrier for the data for the selected channel.

12. (Amended) A broadcast data receiver according to claim 1 wherein when more than two tuners are provided in said broadcast data receiver a number of predicted channels may be selected and the carriers tuned to.

13. (Amended) A method for controlling the tuning of a plurality of tuners provided in a broadcast data receiver for broadcast digital data, said method comprising the steps of:

receiving one of a range of radio frequency data carriers which are transmitted from a broadcaster over a range of radio frequencies;

said broadcast data receiver allowing the selection by the user of a television channel for viewing via a display screen and speakers connected with the broadcast data receiver;

controlling a first tuner to tune to a particular frequency for an radio frequency data carrier to receive data for a user selected television channel to be viewed via the broadcast data receiver and, if a further tuner is free at that instant, said further tuner is tuned to receive data for a channel differing to that which is selected for viewing at that instant and said channel identity is based on a prediction made by the control means for the broadcast data receiver.

14. (Amended) A method according to claim 13 wherein the channel selected for viewing is identified as part of the channel prediction process and, with reference to that channel, reference is made to a memory means in which data relating to previous channel selection patterns is held and the channel or channels which have been subsequently selected by the user on previous occasions is referred to and from this data, a predicted channel identity is determined and the further tuner of the broadcast data receiver is tuned to the appropriate radio frequency carrier for the predicted channel data.

15. (New) A broadcast data receiver for receiving broadcast digital data, said receiver comprising:

control means for selective tuning and for channel identity selection prediction;

storage means for storing data; and

a plurality of tuners to receive a range of data radio frequency carriers at known frequencies including,

a first tuner tuned to a first radio frequency carrier frequency for receiving data for a user selected television channel in accordance with user requirements at an instant and at least one second tuner.

16. (New) A broadcast data receiver according to claim 15 wherein said control means determines the frequency of the predicted channel data carried on a radio frequency carrier.

17. (New) A broadcast data receiver according to claim 16 wherein said control means ignores said predicted channel data occurring on said first radio frequency carrier frequency and thereafter generates the next most probably prediction having data on a radio frequency carrier other than said first radio carrier frequency.

18. (New) A broadcast data receiver according to claim 15 wherein said at least one second tuner stores data received for a second channel in said storage means for subsequent retrieval.

19. (New) A broadcast data receiver according to claim 15 wherein said at least one second tuner may be deemed free and controllable for tuning to a predicted channel.

20. (New) A method for controlling the tuning of a plurality of tuners provided in a broadcast data receiver for broadcast digital data, said method comprising the steps of:
receiving one of a range of radio frequency data carriers transmitted from a broadcaster over a range of radio frequencies;

selecting a television channel for view via a display screen and speakers connected with the broadcast data receiver by a user of the broadcast data receiver;

controlling a first tuner to tune to a particular frequency for a radio frequency data carrier to receive data for a user selected television channel to be viewed via the broadcast data receiver;

tuning at least one free tuner at that instant to receive data for another channel for viewing at that instant; and

basing channel identity on a prediction made by the control means for the broadcast data receiver.